

$$\left(\frac{d}{d}\right)\frac{a}{b} + \frac{c}{d}\left(\frac{b}{b}\right) = \frac{da+cb}{db}$$

$$d \neq 0$$

$$b \neq 0$$

Adding + Subtracting
sums + Differences

p. 66

1. a) $\frac{x}{x+2} \ominus \frac{(x+1)}{x+2} = \frac{-1}{x+2}$

(F)

b) $\frac{(\cancel{x+2})(\cancel{x-3})}{(\cancel{x-3})(\cancel{x+2})} = \cancel{1} 1$

(F)

$$\left(\frac{\cancel{x+1}}{x+1}\right)\frac{x+1}{x-3} + \frac{x-3}{x+1}\left(\frac{\cancel{x-3}}{x-3}\right) 2$$

(F)

$$\frac{(x+1)^2 + (x-3)^2}{(x-3)(x+1)}$$

~~g) $\frac{1}{x+2} = \frac{1}{x} + \frac{1}{2}$~~

(F)

$$\frac{x+2}{3} = \frac{x}{3} + \frac{2}{3} \quad (T)$$

LCD = lowest + common denominator

2. a) $\frac{3}{8}$ $\frac{5}{72}$ (72)

c) $\frac{2}{3x^2}$ $\frac{5}{6x}$ ($6x^2$)

e) $\frac{5}{6x}$ $\frac{13}{4x-8}$ $12x(x-2)$
 $\underline{\quad}$ $\underline{\underline{4(x-2)}}$

l) $\frac{1}{4x-8}$ $\frac{-3}{x^2+2x-8}$ $4(x-2)(x+4)$
 $\underline{\underline{4(x-2)}}$ $\underline{\underline{(x+4)(x-2)}}$

k) $\frac{5}{\underline{x-3}}$ + $\frac{+2}{\underline{3-x}}$
 $x-3$

j) $\frac{2}{x-y}$ + $\frac{3}{\frac{y-x}{x-y}}$

$$3. \quad a) \quad \frac{3x}{x+1} + \frac{3}{x+1} = \frac{3x+3}{x+1} = \frac{3(\cancel{x+1})}{\cancel{x+1}} = 3$$

$$g) \quad \frac{2z}{3z-1} + \frac{-z}{\cancel{3z-1}} = \frac{2z+(-z)}{3z-1} = \frac{z}{3z-1}$$

$$i) \quad \frac{3y-2}{y^2-25} - \frac{4y-7}{y^2-25} = \frac{3y-2-(4y-7)}{y^2-25}$$

$$\frac{\cancel{5}y-1}{(\cancel{y-5})(y+5)}$$

$$= \frac{-y+5}{y^2-25} = \frac{-(\cancel{y-5})}{(y-\cancel{5})(y+5)} = \frac{-1}{y+5}$$

$$p) \quad \frac{2x^2+1}{2x^2-5x-12} - \frac{4-x}{2x^2-5x-12}$$

$$\frac{2x^2+1-(4-x)}{(2x+3)(x-4)} = \frac{\cancel{(2x+3)}(x-1)}{\cancel{(2x+3)}(x-4)} = \frac{x-1}{x-4}$$

$$m) \quad \frac{-x^2}{\cancel{y^2-x^2}} - \frac{y^2}{y^2-x^2} + \frac{2xy}{y^2-x^2}$$

$$\frac{-x^2 - y^2 + 2xy}{\cancel{y^2-x^2}} = \frac{-(x^2 - 2xy + y^2)}{\cancel{y^2-x^2}}$$

$$y^2 - x^2$$

$$(y+x)(y-x)$$

$$= \frac{+(x-y)(\cancel{x-y})}{(y+x)(\cancel{y-x})} = \frac{x-y}{x+y}$$

$$4. \quad c) \frac{4z}{z^2-36} - \frac{2}{z-6} \left(\frac{z+6}{z+6} \right) = \frac{4z-2(z+6)}{(z+6)(z-6)}$$

$$= \frac{4z-2z-12}{(z+6)(z-6)} = \frac{2z-12}{(z+6)(z-6)} = \frac{2(\cancel{z-6})}{(z+6)(\cancel{z-6})}$$

$$\frac{2}{z+6}$$

$$e) \frac{y}{y^2-9} + \frac{-3}{3-y} \left(\frac{y+3}{y+3} \right) = \frac{y-3(y+3)}{(y+3)(y-3)} = \frac{y-3y-9}{(y+3)(y-3)}$$

$$= \frac{-2y-9}{(y+3)(y-3)}$$

$$j) \frac{4}{x^2-4} + \frac{-1}{x-x} \left(\frac{x+2}{x+2} \right) - \frac{1}{x+2} \left(\frac{x-2}{x-2} \right)$$

$$\frac{4-\cancel{x+2}-\cancel{x+2}}{(x+2)(x-2)} = \frac{-2(\cancel{x-2})}{(x+2)(\cancel{x-2})} = \frac{-2}{x+2}$$

$$q) \frac{y-5}{(x^2+5x)+(xy+5y)} + \frac{1}{x+y} \left(\frac{x+5}{x+5} \right) - \frac{2}{x+5} \left(\frac{x+y}{x+y} \right)$$

$$\frac{y-5+x+5-\cancel{2x}-\cancel{2y}}{(x+5)(x+y)} = \frac{-y-x}{(x+5)(x+y)}$$

$$\frac{-y-x}{(x+5)(x+y)}$$

$$= \frac{-(\cancel{y+x})}{(\cancel{x+5})(\cancel{x+y})} = \frac{-1}{x+5}$$

$$t) \frac{a}{(\cancel{b-a})(\cancel{c-a})} + \frac{b}{(\cancel{b-c})(\cancel{a-b})} + \frac{-c}{(\cancel{a-c})(\cancel{c-b})}$$

$$\frac{\cancel{ab} - \cancel{ca} + \cancel{bx} - \cancel{ac} - \cancel{cb} + \cancel{ac}}{(\cancel{b-a})(\cancel{c-a})(\cancel{b-c})} = 0$$

$$n) \frac{x-1}{\underbrace{2x^2+3x+1}_{(2x+1)(x+1)}} - \frac{x+1}{\underbrace{2x^2-x-1}_{(2x+1)(x-1)}} = \frac{(x-1)(x-1) \overset{\text{FOIL}}{\downarrow} - (x+1)(x+1)}{(2x+1)(x+1)(x-1)}$$

$$\frac{\cancel{x^2} - \cancel{2x} + \cancel{1} - (\cancel{x^2} + \cancel{2x} + \cancel{1})}{(2x+1)(x+1)(x-1)} = \frac{-4x}{(2x+1)(x+1)(x-1)}$$

$$r) \frac{2z+11}{z^2+z-6} - \frac{2}{z+3} + \frac{-3}{\cancel{z-2}}$$

$$\frac{\cancel{2z} + \cancel{11} - \cancel{2z} + \cancel{6} - \cancel{3z} - \cancel{9}}{(z+3)(\cancel{z-2})} = \frac{-3z+6}{(z+3)(\cancel{z-2})}$$

$$= \frac{-3}{z+3}$$

Mixed opps

Brackets
Exponents
D ÷
M x
A +
S -

1. a) $\frac{5}{x} - \left(\frac{3}{x^3} \div \frac{2}{x}\right)$

$$\frac{3}{x^2} \cdot \frac{x}{2}$$

$$\left(\frac{2x}{2x}\right) \frac{5}{x} - \frac{3}{2x^2} = \frac{10x-3}{2x^2}$$

c) $\frac{2}{x} + \left(\frac{(x+4)(x+4)}{x^2-y^2} \cdot \frac{12x^2}{4x+4y}\right) = \frac{2}{x} - x^2 \left(\frac{x}{x}\right)$

$$= \frac{2-x^3}{x}$$

e) $\left(\frac{y+3}{y-5} + \frac{y-2}{y+4}\right)(y^2-y-20)$

$$\frac{(y+3)(y+4) + (y-2)(y-5)}{(y-5)(y+4)} \cdot (y-5)(y+4)$$

$$y^2 + 7y + 12 + y^2 - 7y + 10$$

$$2y^2 + 22$$

p. 75

2. c) $\frac{8x^4y^3}{3x} \cdot \frac{4xy^4}{y^2} = \frac{2x^2y}{3}$

i) $\frac{\frac{3}{x-2} + \frac{2}{x+2}}{\frac{4}{x+2} - \frac{5}{x-2}} = \frac{3(x+2) + 2(x-2)}{(x-2)(x+2)} \cdot \frac{4(x-2) - 5(x+2)}{(x-2)(x+2)}$

$$\frac{3x+6+2x-4}{(x-2)(x+2)} \cdot \frac{(x-2)(x+2)}{4x-8-5x-10} = \frac{5x+2}{-x-18}$$

$$0) \frac{\frac{1}{x^2+x} - \frac{1}{xy+y}}{\frac{1}{xy+y} - \frac{1}{x^2+x}}$$

$$\frac{a-b}{b-a} = -1$$

$$\frac{\frac{1}{x(x+1)} - \frac{1}{y(x+1)}}{\frac{1}{y(x+1)} - \frac{1}{x(x+1)}} = \frac{\frac{y-x}{\cancel{xy(x+1)}} \leftarrow}{\frac{x-y}{\cancel{xy(x+1)}} \leftarrow} \rightarrow \frac{y-x}{x-y} = -1$$

Math Test corrections :

$$6. a) -(3\sqrt{2} - \sqrt{5})(\sqrt{2} + 7) - (2\sqrt{2} - \sqrt{5})^2 \text{FOIL} \\ \text{FOIL} \\ (2\sqrt{2} - \sqrt{5}) \\ -(3(2) + 21\sqrt{2} - \sqrt{10} - 7\sqrt{5}) - (4(2) - 2\sqrt{10} - 2\sqrt{10} + 5) \\ \underline{-6} - \underline{21\sqrt{2}} + \underline{\sqrt{10}} + \underline{7\sqrt{5}} - \underline{8} + \underline{4\sqrt{10}} - \underline{5} \\ -19 - 21\sqrt{2} + 5\sqrt{10} + 7\sqrt{5}$$

$$7. a) \frac{10 + 4\sqrt{5}}{5}$$

$$\frac{\cancel{2}(2\sqrt{6} - 3\sqrt{5})}{\cancel{6} \ 3}$$

$$b) \frac{4\sqrt{2} - 6\sqrt{5}}{2\sqrt{3}} \left(\frac{\sqrt{3}}{\sqrt{3}} \right) = \frac{\cancel{2}4\sqrt{6} - \cancel{6}\sqrt{15}}{\cancel{6} \ 3}$$

8. ① isolate $\sqrt{\quad}$ OR
② sq

sep. $\sqrt{\quad}$

③ restrictions

④ check

$$\left(2\sqrt{1-3x} \right)^2 \\ 4(1-3x)$$